

CLAIMS

1. A vehicle drive system, comprising:

5 a rotating electric machine (1, 1A) structured to have a forward direction and a reverse direction as a rotation direction of an output shaft (44), a maximum output in said reverse direction being smaller than the maximum output in said forward direction;

a battery (38) discharging during power running of said rotating electric machine (1, 1A) and being charged during regenerative operation of said rotating electric machine (1, 1A), voltage between terminals of said battery (38) being increased while
10 said battery (38) is charged, and being decreased while said battery (38) discharges; and

a rotary shaft (42) rotating in a direction allowing a vehicle to move forward in accordance with rotation of said output shaft (44) in the forward direction.

2. The vehicle drive system according to claim 1, wherein said rotating electric
15 machine (1, 1A) includes

a stator (2, 30), and

a rotor (3, 33) having a shape that allows the maximum output in the rotation in said reverse direction to be smaller than the maximum output in the rotation in said forward direction.

20 3. The vehicle drive system according to claim 2, wherein
said rotor (33) has a plurality of salient pole portions (35), and
each of said plurality of salient pole portions (35) has a shape tilted with respect to an axis passing through a rotation center and orthogonal to said output shaft.

25 4. The vehicle drive system according to claim 2, wherein said rotor (3) is provided with a flux barrier (22, 24, 26, 28) bilaterally asymmetric with respect to an axis passing through a rotation center and orthogonal to said output shaft.

5. The vehicle drive system according to claim 1, further comprising:
an inverter (36) disposed on a path for receiving and distributing current
between said battery (38) and said rotating electric machine (1, 1A), and
5 a control device (40) obtaining rotation information from said rotating electric
machine (1, 1A) to control said inverter (36), wherein
said control device (40) controls said inverter (36) such that torque in said
forward direction is generated in said rotor (3, 33) in accordance with an acceleration
instruction to allow said rotating electric machine (1, 1A) to perform power running,
10 and that torque in said reverse direction is generated in said rotor (3, 33) in accordance
with a deceleration instruction to allow said rotating electric machine (1, 1A) to perform
regenerative operation.

6. A vehicle, comprising:
15 a vehicle drive system, wherein said vehicle drive system includes
a rotating electric machine (1, 1A) structured to have a forward direction
and a reverse direction as a rotation direction of an output shaft (44), a maximum output
in said reverse direction being smaller than the maximum output in said forward
direction,
20 a battery (38) discharging during power running of said rotating electric
machine (1, 1A) and being charged during regenerative operation of said rotating
electric machine, voltage between terminals of said battery (38) being increased while
said battery (38) is charged, and being decreased while said battery (38) discharges, and
a rotary shaft (42) rotating in a direction allowing a vehicle to move
25 forward in accordance with rotation of said output shaft (44) in the forward direction;
and
a wheel (32) connected to said rotary shaft (42).

7. The vehicle according to claim 6, wherein said rotating electric machine (1, 1A) includes

a stator (2, 30) and

a rotor (3, 33) having a shape that allows the maximum output in the rotation in said reverse direction to be smaller than the maximum output in the rotation in said forward direction.

8. The vehicle according to claim 7, wherein

said rotor (33) has a plurality of salient pole portions (35), and

each of said plurality of salient pole portions (35) has a shape tilted with respect to an axis passing through a rotation center and orthogonal to said output shaft.

9. The vehicle according to claim 7, wherein said rotor (3) is provided with a

flux barrier (22, 24, 26, 28) bilaterally asymmetric with respect to an axis passing through a rotation center and orthogonal to said output shaft.

10. The vehicle according to claim 6, wherein

said vehicle drive system further includes

an inverter (36) disposed on a path for receiving and distributing current between said battery (38) and said rotating electric machine (1), and

a control device (40) obtaining rotation information from said rotating electric machine (1, 1A) to control said inverter (36), and

said control device (40) controls said inverter (36) such that torque in said forward direction is generated in said rotor (3, 33) in accordance with an acceleration instruction to allow said rotating electric machine (1, 1A) to perform power running, and that torque in said reverse direction is generated in said rotor (3, 33) in accordance with a deceleration instruction to allow said rotating electric machine (1, 1A) to perform regenerative operation.